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## NOTICES

### PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

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### ACADEMIA.EDU – Lithic miniaturization in hominin lithic technology

*In Evolutionary Anthropology 28:2, 72-85 (2019).*

#### **JUSTIN PARGETER & JOHN J. SHEA – Going big versus going small: Lithic miniaturization in hominin lithic technology**

Lithic miniaturization was one of our Pleistocene ancestors' more pervasive stone tool production strategies and it marks a key difference between human and non-human tool use. Frequently equated with “microlith” production, lithic miniaturization is a more complex, variable, and evolutionarily consequential phenomenon involving small backed tools, bladelets, small retouched tools, flakes, and small cores. In this review, we evaluate lithic miniaturization's various technological and functional elements. We examine archeological assumptions about why prehistoric stoneworkers engaged in processes of lithic miniaturization by making small stone tools, small elongated tools, and small retouched and backed tools. We point to functional differences that motivate different aspects of lithic miniaturization and several instances where archeological systematics have possibly led archeologists to false negative findings about lithic miniaturization. Finally, we

suggest productive avenues by which archeologists can move closer to understanding the complex evolutionary forces driving variability in lithic miniaturization.

[https://www.academia.edu/38661179/Going\\_big\\_versus\\_going\\_small\\_Lithic\\_miniaturization\\_in\\_hominin\\_lithic\\_technology](https://www.academia.edu/38661179/Going_big_versus_going_small_Lithic_miniaturization_in_hominin_lithic_technology)

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### ACADEMIA.EDU – Sink the Mousterian?

*In Quaternary International 350, 169-179 (2014).*

#### **JOHN J. SHEA – Sink the Mousterian? Named stone tool industries (NASTIES) as obstacles to investigating hominin evolutionary relationships in the Later Middle Paleolithic Levant**

The Later Middle Paleolithic lithic archaeological record for the East Mediterranean Levant has been invoked to support competing and contradictory models for the evolutionary relationships between *Homo sapiens* and *Homo neanderthalensis*. The lithic evidence has not helped paleoanthropology achieve a conclusive resolution about this issue because archaeologists continue to structure inter-assemblage lithic variability in terms of stone tool industries such as the “Mousterian”. This paper explores the problems that named stone tool industries (or “NASTIES”) cause for Paleolithic archaeology, and it explores alternatives to them.

[https://www.academia.edu/9523388/Shea\\_2014\\_Sink\\_the\\_Mousterian\\_Named\\_stone\\_tool\\_industries\\_NASTIES\\_as\\_obstacles\\_to\\_investigating\\_hominin\\_evolutionary\\_relationships\\_in\\_the\\_Later\\_Middle\\_Paleolithic\\_Levant](https://www.academia.edu/9523388/Shea_2014_Sink_the_Mousterian_Named_stone_tool_industries_NASTIES_as_obstacles_to_investigating_hominin_evolutionary_relationships_in_the_Later_Middle_Paleolithic_Levant)

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### HRAF – Selected Papers – <https://hraf.yale.edu/ehc/documents>

#### **HERVEY C. PEOPLES – Hunter-gatherers and the origins of religion – Human Nature, 2016**

What is the evolutionary sequence of beliefs in hunter-gatherers? The authors attempt to answer this question by reconstructing the development of various traits in traditional societies using phylogenetic and linguistic source trees. Testing for correlated evolution between this reconstruction and population history as proxied by linguistic classification suggests the presence of animism at profound time depth, aligning with classical anthropological religious theory put forth by E.B. Tylor. Coevolutions between other religious concepts including shamanism, ancestor worship, active ancestor worship, high gods, active high gods, and belief in an afterlife are also examined.

<https://hraf.yale.edu/ehc/documents/1037>

#### **WILLIAM BUCKNER – Disguises and the Origins of Clothing – Human Nature, 2021**

In this study, the author explores different pathways to the emergence of clothing outside of thermoregulation, with a focus on the use of clothing for disguise or concealment. He finds disguises in 8 out of 10 sampled societies, proposing that attempts at disguise or concealment is one possible pathway to the cultural evolution of clothing. He also finds clothing used for modesty and body armor purposes.

<https://hraf.yale.edu/ehc/documents/1367>

#### **ERKAN GÖREN – The biogeographic origins of novelty-seeking traits – Evolution and Human Behavior, 2016**

The researcher looks for empirical evidence of natural selection as an explanation for worldwide variation in novelty-seeking behavior. Examining the relationship between variability in frequency of the DRD4 exon III 7-repeat allele variant (a variant theorized to stifle dopamine reception and thus encourage compensatory novelty-seeking behavior) and migratory distance from prehistoric humans' origin point in East Africa yields a positive correlation. After controlling for various biogeographic indicators, the researcher theorizes that presence of the DRD4 exon III 7-repeat variant provided an exploratory urge and evolutionary advantage to hunter-gatherers and pastoralists who migrated into unfamiliar environments.

<https://hraf.yale.edu/ehc/documents/1047>

#### **ALBERTO ALESINA – On the origins of gender roles: Women and the plough – The Quarterly Journal of Economics, 2013**

There is considerable variation both within and across societies in attitudes towards female employment outside of the household. In some societies, the dominant belief is that women should have equal opportunity to work outside the home, while in others women are strongly discouraged from working outside of the domestic sphere. Here the authors use pre-industrial ethnographic data and contemporary observations of gender inequality to test the hypothesis that cultural attitudes regarding the appropriateness of women working outside of the household are rooted in the ancestral adoption of plough cultivation. Contemporary measures of gender inequality assess variation across countries, ethnic groups, and individuals.

<https://hraf.yale.edu/ehc/documents/1096>

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### CONFERENCE ALERT – Selfish Evolution: Mechanisms & Consequences of Genetic Conflict

#### **AGA2022 President's Symposium**

For over fifty years, CHAGS conferences have provided a space for researchers interested in hunter-gatherers, including anthropologists and archaeologists. HRAF has participated in past conferences including Vienna (2015) and Penang (2018).

This year, we are pleased to host a workshop at the CHAGS XIII Conference in Dublin, Ireland taking place from June 27 to July 1. The theme of this year's conference is "Living Well Together", which emphasizes how hunter-gatherers seek to live well with all of the other forms of being with which they share and shape their worlds. In this workshop, we will cover:

- A brief introduction to HRAF
- eHRAF databases overview: browsing, searching & indexing
- eHRAF for hunter-gatherer anthropology and archaeology: cross-cultural research on hunter-gatherers
- Additional hunter-gatherer resources from HRAF
- Teaching with eHRAF
- Open Q&A and database search tutorials with input from attendees

Find out more about the CHAGS XIII Conference: <https://www.ucd.ie/chags13/conference/livingwelltogether/>

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## IN MEMORIAM – Professor Zoltán Dörnyei (From BAALMail)

### **PETER STOCKWELL**

It is with great sadness that we pass on the news of the death of our friend and colleague, Professor Zoltán Dörnyei, who died after an illness on Friday 10 June 2022. He will be greatly missed by his family, friends and all of us in the School of English.

Zoltán began as a language teacher for 'International House' in Budapest, before completing his PhD in Psycholinguistics at Eötvös Loránd University in 1989 with the thesis: 'Psycholinguistic factors in foreign language learning'. He began teaching in the School of English and American Studies at Eötvös Loránd University in 1988. A decade later, he moved to the United Kingdom, working first at Thames Valley University, London, and then joining the School of English at the University of Nottingham in 2000. In 2003 he received a DSc. in Linguistics from the Hungarian Academy of Sciences. In 2017 Zoltán also completed a second PhD, this time in Theology from Durham University with the thesis: 'Progressive creation and the struggles of humankind in the Bible: an experiment in canonical narrative interpretation'. He became Professor of Psycholinguistics in 2004.

In the School of English Zoltán's work focused on how motivation affected the language learning process. As a lecturer he taught on modules explaining language learning and teaching English as a second language for undergraduate and postgraduate students. He also regularly conducted teacher training seminars and workshops, and spoke at many conferences for language teachers. He was the author of numerous books on language learning, Christian theology and research methods. His 2007 book, *Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies*, is widely regarded as the key manual in the field. His applied linguistics books encompassed discipline-defining work as well as hands-on practical guides for teachers and fellow researchers. Zoltán was also regarded as a significant theologian and writer on the Christian life. His 2013 co-edited collection, *Christian Faith and English Language Teaching and Learning*, brought together the two sides of his thinking.

We have received a great number of messages of condolence from many former students of Zoltán's recalling fond memories of inspirational lectures, kind and wise mentorship, and encouragement towards their own intellectual rigour. His legacy will remain not only in the major body of published work that he leaves for future scholars, but in the thousands of teachers worldwide he has influenced, and the language classrooms that have been changed under his inspiration. It is remarkable to witness the respect, admiration and love not only from his many former doctoral students but also from those who never met him yet were touched by his influence. This reach across the world will ensure the spirit of his work will long endure.

### **JEAN-MARC DEWAELE**

Zoltán was a man of boundless energy, amazing erudition, unwavering focus, blazing self-confidence and profound kindness. He also had a wicked sense of humour and he enjoyed challenges and teasing. When introducing him as a plenary speaker at PLL3 in Tokyo, I asked rhetorically whether he was the pope of L2 motivation research (a reference to both his status in the field and his faith) before suggesting that given his combative streak, he was more like a muscular Batman, collaborating with a large number of "Robins". He laughed, along with his sons, wife and conference participants. I'm proud to have been one of his last "Robins", co-authoring the third edition of *Questionnaires in SLA* for Routledge. His last communication with me and the publisher was his approval of my choice of cover in early May.

### **EMA USHIODA**

Zoltán Dörnyei was a prolific, clever, engaging, witty, and truly remarkable scholar. Without question, he transformed the field of motivation and individual differences research in applied linguistics and inspired new generations of scholars to explore the psychology of language learning. As a motivation specialist he led by example through his own irrepressible enthusiasm, intellectual energy, and visionary approach, and he motivated everyone (colleagues, collaborators, students, teachers) who had the good fortune to engage with him or hear him deliver one of his fascinating (and always very funny) talks. (Who can forget how he managed to reference Arnold Schwarzenegger as The Terminator in a talk on individual

differences?!) Yet, most importantly perhaps, aside from being such a motivating, passionate and brilliant academic, Zoltán was a wonderful human being – always kind, encouraging and supportive, and full of good humour. He leaves behind a tremendous legacy for the field of applied linguistics through his scholarly work, and a tremendous legacy for those who knew him through our fond memories of interacting with and learning from him.

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## NEWS

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### SAPIENS – Did Dads Evolve?

Most male mammals are not involved in raising their offspring. Anthropological observations of fatherhood can provide insight into how—and why—humans are so different.

<https://www.sapiens.org/biology/did-dads-evolve/>

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### SCIENCE DAILY – For communication between brain areas, milliseconds matter

Understanding how brain areas communicate is one of the oldest questions in neuroscience. Researchers used causal techniques to uncover how two neocortical areas in the brain communicate with one another and found that their influence on each other changes over much faster-timescales than previously thought.

<https://www.sciencedaily.com/releases/2022/06/220610120210.htm>

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### SCIENCE DAILY – Understanding learning by inference

Both humans and other animals are good at learning by inference, using information we do have to figure out things we cannot observe directly. New research shows how our brains achieve this by constructing cognitive maps.

<https://www.sciencedaily.com/releases/2022/06/220616152507.htm>

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### SCIENCE DAILY – Harming the 'outgroup' is linked to elevated activity in the brain's reward circuitry

Humans tend to form groups, which often find themselves in conflict with rival groups. But why do people show such a ready tendency to harm people in opposing groups? A new study led by researchers at Virginia Commonwealth University used functional brain imaging technology to reveal a potential answer: It increases activity in the brain's reward network.

<https://www.sciencedaily.com/releases/2022/06/220616135231.htm>

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### SCIENCE DAILY – Shedding light on linguistic diversity and its evolution

Scholars have created a new global repository of linguistic data. The project is designed to facilitate new insights into the evolution of words and sounds of the languages spoken across the world today. The Lexibank database contains standardized lexical data for more than 2000 languages. It is the most extensive publicly available collection compiled so far.

<https://www.sciencedaily.com/releases/2022/06/220616121630.htm>

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### SCIENCE DAILY – How the cerebellum modulates our ability to socialize

The cerebellum is essential for sensorimotor control but also contributes to higher cognitive functions including social behaviors. Researchers uncovered how dopamine in the cerebellum modulates social behaviors via its action on D2 receptors (D2R). These new findings pave the way to determine whether socially related psychiatric disorders are also associated with altered dopamine receptors expression in specific cerebellar cell types.

<https://www.sciencedaily.com/releases/2022/06/220616121543.htm>

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### SCIENCE NEWS – Artificial intelligence may have unearthed one of the world's oldest campfires

Human ancestors may have been cooking at site in Israel nearly 1 million years ago.

<https://www.science.org/content/article/artificial-intelligence-may-have-unearthed-one-world-s-oldest-campfires>

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### SOCIETY FOR SCIENCE – Lucy Cooke's new book 'Bitch' busts myths about female animals

Sexism in biology has left females misunderstood.

<https://www.sciencenews.org/article/female-animal-myths-lucy-cooke-new-book-bitch-biology-sexism>

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## PUBLICATIONS

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### Animal Behaviour

#### PAPERS

#### INDIA A. SCHNEIDER-CREASE et al – Stronger maternal social bonds and higher rank are associated with accelerated Infant maturation in Kinda baboons

Social relationships are critical components of health and fitness for humans and other animals. For female-philopatric species, affiliative relationships among females (kin and nonkin alike) can influence components of fitness that include individual survival, interbirth interval and offspring survival. Affiliative relationships with males have attracted somewhat less

attention, with most studies focusing on female–male relationships as adaptations for infanticide avoidance. Here, we use 8 years of behavioural data on Kinda baboons, *Papio kindae*, to assess whether maternal social relationships—both among females and between females and males—affect infant survival, interbirth interval and the pace of infant development. Kinda baboons are an ideal system for these analyses because males and females form strong relationships outside of the periovulatory period and in the absence of obvious infanticide threat. We calculated social metrics that reflected dominance status, total social integration and social bond strength and paired these metrics with data on offspring survival, interbirth interval (IBI) duration and infant behavioural maturation. Neither dominance rank nor sociality had a significant effect on interbirth interval or survival, but higher rank and the stronger affiliative relationships between a female and her top female and top male social partners predicted more rapid infant behavioural maturation. These results suggest that maternal dominance and sociality may confer advantages related to infant development and independence that ultimately may permit females to more quickly invest in subsequent offspring and point to advantages of relationships with males outside of lowering infanticide threat.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347222001166>

### **C. WILKE et al with R.W. WRANGHAM, K. ZUBERBÜHLER & K.E. SLOCOMBE – Referential gestures are not ubiquitous in wild chimpanzees: alternative functions for exaggerated loud scratch gestures**

A fundamental aspect of human communication is our ability to refer to external objects and events through both words and gestures (such as pointing), yet the evolutionary origins of such signals remain obscure. Apes, living in their natural environments, rarely or never point, but it has been claimed that male chimpanzees, *Pan troglodytes schweinfurthii*, from the Ngogo community, Uganda, habitually use exaggerated loud scratches (ELSs) to refer to specific body locations where they wish to be groomed (Pika & Mitani, 2006, *Current Biology*, 16(6), 191–192). This study suggested continuity between referential abilities in humans and our closest living relatives, making it an important finding to replicate in other populations. Hence here, we compared whether ELSs are used in a referential manner across four wild communities of eastern chimpanzees (Ngogo, Kanyawara, Sonso and Waibira). Our data show that scratchers were significantly more likely to receive grooming in the scratched location at Ngogo compared to the other three sites. At the latter sites this response occurred at low rates and signallers did not seem to pursue this goal. This suggests that ELSs do not function referentially at these sites, and the published findings from Ngogo were not replicated. Further exploration into alternative functions of ELSs in the Kanyawara community revealed that, in this community, this signal functions to initiate grooming bouts and to reengage partners during grooming pauses. Individuals who produced the signal to initiate grooming were likely to offer grooming. In contrast, during grooming bouts, groomers produced ELSs to request reciprocation of grooming from their partner. Our study demonstrates that chimpanzees do not ubiquitously use the ELS in a referential manner, but that they can use this gesture in a highly flexible fashion, with signal function depending on the intricate details of the social contexts in which they are produced.

<https://www.sciencedirect.com/science/article/pii/S0003347222001014>

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## Frontiers for Young Minds

### PAPERS

#### **MARINE SIWIASZCZYK, SCOTT A. LOVE & ELODIE CHAILLOU – “BAA, BAA”: Can Sheep Talk to Each Other?**

If you have ever been out to the countryside in the spring, you might have heard sheep bleating to their lambs. Sheep also bleat when they are separated from the flock or stressed in some other way. To us, all these bleats sound very similar. But do you think they also sound similar to the lambs? Or do you think the lambs know whose mother is calling and what they are saying? Scientists try to interpret the bleats of sheep by observing their behavior when they hear these sounds. They study the sound waves of recorded bleats to identify each sheep’s unique voice and even determine which emotions the sheep are feeling. They also investigate the brain to find out what is going on inside the heads of sheep when they hear and understand the sounds of other sheep. Studies show that sheep really can recognize each other’s voices and communicate vocally.

<https://kids.frontiersin.org/articles/10.3389/frym.2022.703514>

#### **CHRISTIAN J. SUMNER et al – What Makes Human Hearing Special?**

Humans and many other animals can hear a wide range of sounds. We can hear low and high notes and both quiet and loud sounds. We are also very good at telling the difference between sounds that are similar, like the speech sounds “argh” and “ah,” and picking apart sounds that are mixed together, like when an orchestra is playing. But how do human hearing abilities compare to those of other animals? In this article, we discover how the inner ear determines hearing abilities. Many other mammals can hear very high notes that we cannot, and some can hear quiet sounds that we cannot. However, humans may be better than any other species at distinguishing similar sounds. We know this because, milliseconds after the sounds around us go into our ears, other sounds come out: sounds that are actually produced by those same ears!

<https://kids.frontiersin.org/articles/10.3389/frym.2022.708921>

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## Frontiers in Neuroscience

### PAPERS

#### **SAWA SENZAKI et al – Emotion or Evaluation: Cultural Differences in the Parental Socialization of Moral Judgement**

Moral reasoning develops rapidly in early childhood. Recent evidence from cognitive neuroscience literature suggests that the development of moral reasoning is supported by an integration of cognitive and affective components. However, the role of culture in the development of moral reasoning in young children is under-investigated. Previous cross-cultural research suggests that culture shapes how people interpret other's behaviors. In particular, people raised in independent cultures, such as the United States, tend to form impressions of others and attribute others' behaviors to their personal dispositions more quickly than people raised in interdependent cultures, such as Japan. In the present cross-cultural study, we examined parents' discourse with children in Japan and the United States. Parents and their 3- to 4-year-old children were asked to view and discuss cartoon characters depicting prosocial and antisocial acts. Results indicated that in both cultures, parents discussed about moral actions (e.g., helping, harming) of characters. Furthermore, United States parents were more likely to evaluate dispositional characteristics of characters based on their pro-social and anti-social acts, whereas Japanese parents were more likely to refer to emotion of the characters who got hurt. We discuss implications of cross-cultural differences and similarities in parental moral socialization and the development of moral reasoning in young children.

<https://www.frontiersin.org/articles/10.3389/fnhum.2022.867308/full>

#### **FELIPE PEGADO – Written Language Acquisition Is Both Shaped by and Has an Impact on Brain Functioning and Cognition**

Spoken language is a distinctive trace of our species and it is naturally acquired during infancy. Written language, in contrast, is artificial, and the correspondences between arbitrary visual symbols and the spoken language for reading and writing should be explicitly learned with external help. In this paper, I present several examples of how written language acquisition is both shaped by and has an impact on brain function and cognition. They show in one hand how our phylogenetic legacy influences education and on the other hand how ontogenetic needs for education can rapidly subdue deeply rooted neurocognitive mechanisms. The understanding of this bidirectional influences provides a more dynamic view of how plasticity interfaces phylogeny and ontogeny in human learning, with implications for both neurosciences and education.

<https://www.frontiersin.org/articles/10.3389/fnhum.2022.819956/full>

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## Frontiers in Psychology

### PAPERS

#### **ELISA BRAZZELLI, ALESSANDRO PEPE & ILARIA GRAZZANI – Prosocial Behavior in Toddlerhood: The Contribution of Emotion Knowledge, Theory of Mind, and Language Ability**

While scholars have previously investigated the respective contributions of emotional knowledge and language ability to toddlers' prosociality, no studies to date have featured a battery of multiple direct measures assessing both of these abilities plus theory of mind on the one hand, and prosocial behavior on the other hand. In contrast, we conducted the present cross-sectional study with a view to evaluating the unique contributions of each of these three social cognition variables as antecedents of prosocial conduct during toddlerhood, measuring them via a series of individually administered standardized tasks. Furthermore, given that the existing literature documents mixed gender effects, we also set out to explore the role of gender in toddlers' prosociality. Finally, we also controlled for any effects of age on the patterns of association among the key variables. Participants were 127 children aged between 24 and 36 months ( $M = 29.2$  months;  $SD = 3.5$ ). We identified significant correlations among the variables under study. In addition, stepwise multiple regression analysis suggested that each of the social cognition (SC) abilities – i.e., emotion knowledge, theory of mind, and language - made a unique contribution to explaining variance in prosocial behaviors (PB). These findings show that SC is already associated with PB in toddlerhood and suggest the importance of fostering social cognition competence from the early years, with a view to increasing children's propensity to engage in prosocial conduct.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.897812/full>

#### **LIA QUEIROZ DO AMARAL – Safe Carrying of Heavy Infants Together With Hair Properties Explain Human Evolution**

As a physicist, my scientific career was interrupted by maternity, and afterward retaken, with a parallel independent personal perspective on human evolution. My previous published contributions are reanalyzed as Hypothesis and Theory. The focus is on safe infant carrying in primates, sexual selection among Hominoidea, fur reduction in hominins, and tensile properties of hominoid hairs, justifying the necessary change to bipedal locomotion from the overwhelming selective pressure of infant survival. The Discussion starts with analysis of existing bias against acceptance of these new ideas, first with rational arguments on bias existing between Exact Sciences and Biological Sciences. A reanalysis of data on elasticity of hominoid hairs is made, based on published differences between statistical analysis of measurements in exact and inexact sciences. A table constructed from the original data on hair elasticity allows a simplified discussion, based on statistics used in Physics in the study of "known samples," adding extra information to the available data. Published data on hair density in primates and mammals allow the conclusion that hair elastic properties might have evolved correlated to the pressure of safe carrying of heavy infants, with an upper limit of 1 kgf/cm<sup>2</sup> for safe infant clinging to primate mother's hair. The Discussion enters then on the main ideological bias, related to the resistance in the academy to the idea that bipedalism could be connected to a

“female problem,” that means, that it was not a “male acquisition.” Tripedal walk, occurring naturally among African Apes carrying their newborns, unable to support themselves by ventral clinging, is the natural candidate leading to evolution of bipedal locomotion. Tripedal walk as an intermediate stage to bipedalism was in fact theoretically proposed, but ignoring its role in primate transportation by ape mothers. The Discussion proceeds to a proposal of phylogenetic evolution of Hominoids, the usual focus on the males changes to the role of females with infants, allowing an integrated view on Hominin evolution, with fur reduction and thermoregulation of the naked skin, with subcutaneous insulating fat layer. The model for earliest hominin social structures is based on huddle formation and hormonally defined rites of passage.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.854948/full>

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## Nature

### PAPERS

#### **SOPHIE BERGMANN et al – Spatial profiling of early primate gastrulation in utero**

Gastrulation controls the emergence of cellular diversity and axis patterning in the early embryo. In mammals, this transformation is orchestrated by dynamic signalling centres at the interface of embryonic and extraembryonic tissues<sup>1–3</sup>. Elucidating the molecular framework of axis formation in vivo is fundamental for our understanding of human development<sup>4–6</sup> and to advance stem-cell-based regenerative approaches<sup>7</sup>. Here, we illuminate early gastrulation of marmoset embryos in utero by spatial transcriptomics and stem cell-based embryo models. Gaussian process regression-based 3D-transcriptomes delineate the emergence of the anterior visceral endoderm, which is hallmarked by conserved (HHEX, LEFTY2, LHX1) and primate-specific (POSTN, SDC4, FZD5) factors. WNT signalling spatially coordinates primitive streak formation in the embryonic disc and is counteracted by SFRP1/2 to sustain pluripotency in the anterior domain. Amnion specification occurs at the boundaries of the embryonic disc through ID1/2/3 in response to BMP-signalling, providing a developmental rationale for amnion differentiation of primate pluripotent stem cells (PSCs). Spatial identity mapping demonstrates that primed marmoset PSCs exhibit highest similarity to the anterior embryonic disc, while naïve PSCs resemble the preimplantation epiblast. Our 3D-transcriptome models reveal the molecular code of lineage specification in the primate embryo and provide an in vivo reference to decipher human development.

<https://www.nature.com/articles/s41586-022-04953-1>

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## Nature Human Behaviour

### NEWS

#### **Human neonates learn to recognize speech sounds on the first day of life**

Human neonates discriminate vowel sounds played forward, as in normal speech, from their waveform reversal after five hours of exposure on the first day of their life. The neural dynamics supporting this rapid perceptual learning indicate a primitive brain mechanism similar to the language-processing network of adults.

<https://www.nature.com/articles/s41562-022-01368-w>

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### PAPERS

#### **MARIA NIARCHOU et al with 23ANDME RESEARCH TEAM – Genome-wide association study of musical beat synchronization demonstrates high polygenicity**

Moving in synchrony to the beat is a fundamental component of musicality. Here we conducted a genome-wide association study to identify common genetic variants associated with beat synchronization in 606,825 individuals. Beat synchronization exhibited a highly polygenic architecture, with 69 loci reaching genome-wide significance ( $P < 5 \times 10^{-8}$ ) and single-nucleotide-polymorphism-based heritability (on the liability scale) of 13%–16%. Heritability was enriched for genes expressed in brain tissues and for fetal and adult brain-specific gene regulatory elements, underscoring the role of central-nervous-system-expressed genes linked to the genetic basis of the trait. We performed validations of the self-report phenotype (through separate experiments) and of the genome-wide association study (polygenic scores for beat synchronization were associated with patients algorithmically classified as musicians in medical records of a separate biobank). Genetic correlations with breathing function, motor function, processing speed and chronotype suggest shared genetic architecture with beat synchronization and provide avenues for new phenotypic and genetic explorations.

<https://www.nature.com/articles/s41562-022-01359-x>

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## Nature Humanities & Social Sciences Communications

### PAPERS

#### **NICO NEUREITER et al – Detecting contact in language trees: a Bayesian phylogenetic model with horizontal transfer**

Phylogenetic trees are a central tool for studying language evolution and have wide implications for understanding cultural evolution as a whole. For example, they have been the basis of studies on the evolution of musical instruments, religious beliefs and political complexity. Bayesian phylogenetic methods are transparent regarding the data and assumptions underlying the inference. One of these assumptions—that languages change independently—is incompatible with the reality of language evolution, particularly with language contact. When speakers interact, languages frequently borrow linguistic traits from each other. Phylogenetic methods ignore this issue, which can lead to errors in the reconstruction. More importantly, they neglect the rich history of language contact. A principled way of integrating language contact in

phylogenetic methods is sorely missing. We present *contactTrees*, a Bayesian phylogenetic model with horizontal transfer for language evolution. The model efficiently infers the phylogenetic tree of a language family and contact events between its clades. The implementation is available as a package for the phylogenetics software BEAST 2. We apply *contactTrees* in a simulation study and a case study on a subset of well-documented Indo-European languages. The simulation study demonstrates that *contactTrees* correctly reconstructs the history of a simulated language family, including simulated contact events. Moreover, it shows that ignoring contact can lead to systematic errors in the estimated tree height, rate of change and tree topology, which can be avoided with *contactTrees*. The case study confirms that *contactTrees* reconstructs known contact events in the history of Indo-European and finds known loanwords, demonstrating its practical potential. The model has a higher statistical fit to the data than a conventional phylogenetic reconstruction, and the reconstructed tree height is significantly closer to well-attested estimates. Our method closes a long-standing gap between the theoretical and empirical models of cultural evolution. The implications are especially relevant for less documented language families, where our knowledge of past contacts and linguistic borrowings is limited. Since linguistic phylogenies have become the backbone of many studies of cultural evolution, the addition of this integral piece of the puzzle is crucial in the endeavour to understand the history of human culture.

<https://www.nature.com/articles/s41599-022-01211-7>

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## Nature Scientific Reports

### PAPERS

#### **CARLOS NETO DE CARVALHO et al – Aurochs roamed along the SW coast of Andalusia (Spain) during Late Pleistocene**

In the Iberian Peninsula the fossil record of artiodactyls spans over 53 million years. During the Pleistocene, wild cattle species such as Bison and especially Bos became common. In Late Pleistocene, the aurochs (*Bos primigenius*) was widespread and the only bovine living along the large river valleys of southern Iberia. Although commonly found in fossil sites and especially in cave bone assemblages, the trace fossil record of aurochs was known worldwide only from the Holocene. Large bovine and roe deer/caprine tracks were found in at least five horizons of the early Late Pleistocene (MIS 5) beach and eolian deposits of Cape Trafalgar (Cadiz Province, South of Spain). The large bovine tracks are formally described as *Bovinichnus uripeda* *igen. et isp. nov.* and compared with the record of aurochs tracks, large red deer tracks and steppe bison biogeographical distribution in Iberia. Aurochs were the most likely producers of the newly described Trafalgar Trampled Surface (TTS) and some of the large artiodactyl tracks in the Matalascañas Trampled Surface, representing the oldest aurochs track record known. This new evidence, together with comparisons with the record of possible aurochs tracks in the Mid-Late Pleistocene coastal deposits from the Asperillo cliff section in Matalascañas (Huelva Province, SW Spain) and bone assemblages known in Gibraltar, point to a recurrent use of the coastal habitat by these large artiodactyls in SW Iberia.

<https://www.nature.com/articles/s41598-022-14137-6>

#### **LAVINIA M. STANCAMPIANO et al with AUDAX MABULLA – New site at Olduvai Gorge (AGS, Bed I, 1.84 Mya) widens the range of locations where hominins engaged in butchery**

Outstanding questions about human evolution include systematic connections between critical landscape resources—such as water and food—and how these shaped the competitive and biodiverse environment(s) that our ancestors inhabited. Here, we report fossil n-alkyl lipid biomarkers and their associated  $\delta^{13}\text{C}$  values across a newly discovered Olduvai Gorge site (AGS) dated to 1.84 million years ago, enabling a multiproxy analysis of the distributions of critical local landscape resources across an explicit locus of hominin activity. Our results reveal that AGS was a seasonally waterlogged, largely unvegetated lakeside site situated near an ephemeral freshwater river surrounded by arid-adapted C4 grasses. The sparse vegetation at AGS contrasts with reconstructed (micro)habitats at the other anthropogenic sites at Olduvai Gorge, suggesting that central-provisioning places depended more heavily on water access than vegetation *viz.* woody plants as is often observed for modern hunter-gatherers. As hominins at AGS performed similar butchering activities as at other Bed I sites, our results suggest they did not need the shelter of trees and thus occupied a competitive position within the predatory guild.

<https://www.nature.com/articles/s41598-022-14031-1>

#### **ALEJANDRO ANDIRKÓ et al with CEDRIC BOECKX – Temporal mapping of derived high-frequency gene variants supports the mosaic nature of the evolution of *Homo sapiens***

Large-scale estimations of the time of emergence of variants are essential to examine hypotheses concerning human evolution with precision. Using an open repository of genetic variant age estimations, we offer here a temporal evaluation of various evolutionarily relevant datasets, such as *Homo sapiens*-specific variants, high-frequency variants found in genetic windows under positive selection, introgressed variants from extinct human species, as well as putative regulatory variants specific to various brain regions. We find a recurrent bimodal distribution of high-frequency variants, but also evidence for specific enrichments of gene categories in distinct time windows, pointing to different periods of phenotypic changes, resulting in a mosaic. With a temporal classification of genetic mutations in hand, we then applied a machine learning tool to predict what genes have changed more in certain time windows, and which tissues these genes may have impacted more. Overall, we provide a fine-grained temporal mapping of derived variants in *Homo sapiens* that helps to illuminate the intricate evolutionary history of our species.

<https://www.nature.com/articles/s41598-022-13589-0>

## **CARINA R. OEHRN et al – Non-invasive vagus nerve stimulation in epilepsy patients enhances cooperative behavior in the prisoner's dilemma task**

The vagus nerve constitutes a key link between the autonomic and the central nervous system. Previous studies provide evidence for the impact of vagal activity on distinct cognitive processes including functions related to social cognition. Recent studies in animals and humans show that vagus nerve stimulation is associated with enhanced reward-seeking and dopamine-release in the brain. Social interaction recruits similar brain circuits to reward processing. We hypothesize that vagus nerve stimulation (VNS) boosts rewarding aspects of social behavior and compare the impact of transcutaneous VNS (tVNS) and sham stimulation on social interaction in 19 epilepsy patients in a double-blind pseudo-randomized study with cross-over design. Using a well-established paradigm, i.e., the prisoner's dilemma, we investigate effects of stimulation on cooperative behavior, as well as interactions of stimulation effects with patient characteristics. A repeated-measures ANOVA and a linear mixed-effects model provide converging evidence that tVNS boosts cooperation. Post-hoc correlations reveal that this effect varies as a function of neuroticism, a personality trait linked to the dopaminergic system. Behavioral modeling indicates that tVNS induces a behavioral starting bias towards cooperation, which is independent of the decision process. This study provides evidence for the causal influence of vagus nerve activity on social interaction.

<https://www.nature.com/articles/s41598-022-14237-3>

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## **Nature Sustainability**

### **PAPERS**

#### **PAUL G. BAIN & RENATA BONGIORNO – Evidence from 33 countries challenges the assumption of unlimited wants**

Humans have unlimited wants. This foundational economic principle and widely accepted assumption about human nature poses considerable challenges to addressing sustainability because pursuing wealth and economic growth to meet unlimited wants increases resource use and pollution. Here we show evidence that this principle is not universal, and actually applies only to a minority of people. Across 42 community samples (N = 7,860) from 33 countries spanning 6 continents, we examined how much money people wanted in their absolutely ideal life. In 86% of countries the majority of people thought they would achieve their absolutely ideal lives with US\$10 million or less, and in some countries as little as US\$1 million or less. However, a substantial minority (8–39% across countries) wanted as much money as they could obtain, indicating unlimited wants. Limited and unlimited wealth ideals were not related to country differences in economic development, but those with unlimited wants tended to be younger, city-dwelling people who valued power, success and independence, and lived in countries with a greater collective focus and acceptance of power differences. The results suggest that transformative approaches relying on limiting wealth and growth to achieve sustainability may be more consistent with human ideals and aspirations than commonly believed.

<https://www.nature.com/articles/s41893-022-00902-y>

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## **New Scientist**

### **NEWS**

#### **AI finds hidden evidence of ancient human fires 1 million years ago**

An AI tool has spotted subtle evidence of changes in flint tools that indicate ancient humans had cooking fires at a 1-million-year-old archaeological site in Israel.

<https://www.newscientist.com/article/2323899-ai-finds-hidden-evidence-of-ancient-human-fires-1-million-years-ago/#ixzz7WOhEt0Mf>

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### **ARTICLES**

#### **GRAHAM LAWTON – How long does evolution take? It happens on two different timescales**

To make sense of the fact that adaptation can happen quickly and yet true evolutionary change seems to take forever, biologists suggest that evolution runs on two very different clocks.

<https://www.newscientist.com/article/mg25433910-900-how-long-does-evolution-take-it-happens-on-two-different-timescales/#ixzz7WOhRA13A>

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## **PLoS One**

### **PAPERS**

#### **DANIEL KLEINMAN et al – Lasting effects of the COVID-19 pandemic on language processing**

A central question in understanding human language is how people store, access, and comprehend words. The ongoing COVID-19 pandemic presented a natural experiment to investigate whether language comprehension can be changed in a lasting way by external experiences. We leveraged the sudden increase in the frequency of certain words (mask, isolation, lockdown) to investigate the effects of rapid contextual changes on word comprehension, measured over 10 months within the first year of the pandemic. Using the phonemic restoration paradigm, in which listeners are presented with ambiguous auditory input and report which word they hear, we conducted four online experiments with adult participants across the United States (combined N = 899). We find that the pandemic has reshaped language processing for the long term, changing how listeners process speech and what they expect from ambiguous input. These results show that abrupt changes in linguistic exposure can cause enduring changes to the language system.

**GLADEZ SHORLAND et al with KLAUS ZUBERBÜHLER – Bonobos assign meaning to food calls based on caller food preferences**

Human communication relies heavily on pragmatic competence. Speech utterances are often ambiguous requiring listeners to use interaction history, shared knowledge, presumed intention and other contextual variables to make inferences about a speaker's meaning. To probe the evolutionary origins of pragmatic competence we tested whether bonobos (*Pan paniscus*) can make inferences about the type of food available from listening to other group members' food calls. We trained two group members to either prefer blue or pink chow and demonstrated these preferences to observers. A third group member served as an untrained control. In playback experiments, we broadcast the food calls of a trained demonstrator and the untrained group member to investigate whether subjects were able to infer which coloured chow was most likely available, based on the callers' trained food preferences or lack thereof. As predicted, when hearing the untrained group member's calls, subjects did not exhibit a bias, whereas they responded with a significant foraging bias when hearing a trained group member's calls. These findings suggest that bonobos may take into account the idiosyncratic food preferences of others, although subjects probably differed in what they remembered.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0267574>

**LEORE GROSMAN et al – Artifact3-D: New software for accurate, objective and efficient 3D analysis and documentation of archaeological artifacts**

The study of artifacts is fundamental to archaeological research. The features of individual artifacts are recorded, analyzed, and compared within and between contextual assemblages. Here we present and make available for academic-use Artifact3-D, a new software package comprised of a suite of analysis and documentation procedures for archaeological artifacts. We introduce it here, alongside real archaeological case studies to demonstrate its utility. Artifact3-D equips its users with a range of computational functions for accurate measurements, including orthogonal distances, surface area, volume, CoM, edge angles, asymmetry, and scar attributes. Metrics and figures for each of these measurements are easily exported for the purposes of further analysis and illustration. We test these functions on a range of real archaeological case studies pertaining to tool functionality, technological organization, manufacturing traditions, knapping techniques, and knapper skill. Here we focus on lithic artifacts, but the Artifact3-D software can be used on any artifact type to address the needs of modern archaeology. Computational methods are increasingly becoming entwined in the excavation, documentation, analysis, database creation, and publication of archaeological research. Artifact3-D offers functions to address every stage of this workflow. It equips the user with the requisite toolkit for archaeological research that is accurate, objective, repeatable and efficient. This program will help archaeological research deal with the abundant material found during excavations and will open new horizons in research trajectories.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0268401>

**BRENDAN BO O'CONNOR et al – Moral psychology from the lab to the wild: Relief registries as a paradigm for studying real-world altruism**

Experimental psychology's recent shift toward low-effort, high-volume methods (e.g., self-reports, online studies) and away from the more effortful study of naturalistic behavior raises concerns about the ecological validity of findings from these fields, concerns that have become particularly apparent in the field of moral psychology. To help address these concerns, we introduce a method allowing researchers to investigate an important, widespread form of altruistic behavior—charitable donations—in a manner balancing competing concerns about internal validity, ecological validity, and ease of implementation: relief registries, which leverage existing online gift registry platforms to allow research subjects to choose among highly needed donation items to ship directly to charitable organizations. Here, we demonstrate the use of relief registries in two experiments exploring the ecological validity of the finding from our own research that people are more willing to help others after having imagined themselves doing so. In this way, we sought to provide a blueprint for researchers seeking to enhance the ecological validity of their own research in a narrow sense (i.e., by using the relief registry method we introduce) and in broader terms by adapting methods that take advantage of modern technology to directly impact others' lives outside the lab.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0269469>

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**Proceedings of the Royal Society B**

**PAPERS**

**ELENA CAMPOY et al – Genomic architecture and functional effects of potential human inversion supergenes**

Supergenes are involved in adaptation in multiple organisms, but they are little known in humans. Genomic inversions are the most common mechanism of supergene generation and maintenance. Here, we review the information about two large inversions that are the best examples of potential human supergenes. In addition, we do an integrative analysis of the newest data to understand better their functional effects and underlying genetic changes. We have found that the highly divergent haplotypes of the 17q21.31 inversion of approximately 1.5 Mb have multiple phenotypic associations, with consistent effects in brain-related traits, red and white blood cells, lung function, male and female characteristics and disease risk. By combining gene expression and nucleotide variation data, we also analysed the molecular differences between

haplotypes, including gene duplications, amino acid substitutions and regulatory changes, and identify CRHR1, KANLS1 and MAPT as good candidates to be responsible for these phenotypes. The situation is more complex for the 8p23.1 inversion, where there is no clear genetic differentiation. However, the inversion is associated with several related phenotypes and gene expression differences that could be linked to haplotypes specific of one orientation. Our work, therefore, contributes to the characterization of both exceptional variants and illustrates the important role of inversions.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2021.0209>

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## Trends in Cognitive Sciences

### PAPERS

#### **ROBIN A.A. INCE, JIM W. KAY & PHILIPPE G. SCHYNS – Within-participant statistics for cognitive science**

Experimental studies in cognitive science typically focus on the population average effect. An alternative is to test each individual participant and then quantify the proportion of the population that would show the effect: the prevalence, or participant replication probability. We argue that this approach has conceptual and practical advantages.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00114-0](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00114-0)

#### **LIAD MUDRIK et al – Free will without consciousness?**

Findings demonstrating decision-related neural activity preceding volitional actions have dominated the discussion about how science can inform the free will debate. These discussions have largely ignored studies suggesting that decisions might be influenced or biased by various unconscious processes. If these effects are indeed real, do they render subjects' decisions less free or even unfree? Here, we argue that, while unconscious influences on decision-making do not threaten the existence of free will in general, they provide important information about limitations on freedom in specific circumstances. We demonstrate that aspects of this long-lasting controversy are empirically testable and provide insight into their bearing on degrees of freedom, laying the groundwork for future scientific-philosophical approaches.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00063-8](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00063-8)

#### **LARS CHITTKA & NATACHA ROSSI – Social cognition in insects**

Insects feature some of the most complex societies in the animal kingdom, but a historic perception persists that such complexity emerges from interactions between individuals whose behaviours are largely guided by innate routines. Challenging this perception, recent work shows that insects feature many aspects of social intelligence found in vertebrate societies, such as individual recognition, learning object manipulation by observation, and elements of cultural traditions. Insects also display emotion-like states, which may be linked to social behaviours such as rescuing others from danger. We review recent developments in insect social cognition and speculate that some forms of now-hardwired behaviour (e.g., nest construction) could have initially been the result of individual innovation and subsequent cultural spread, with evolution later cementing these behaviours into innate behaviour routines.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00085-7](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00085-7)

#### **ISOBEL A. HECK, KRISTIN SHUTTS & KATHERINE D. KINZLER – Children's thinking about group-based social hierarchies**

Wealth, power, and status are distributed unevenly across social groups. A surge of recent research reveals that people begin recognizing, representing, and reasoning about group-based patterns of inequity during the first years of life. We first synthesize recent research on what children learn about group-based social hierarchies as well as how this learning occurs. We then discuss how children not only learn about societal structures but become active participants in them. Studying the origins and development of children's thoughts and behavior regarding group-based social hierarchies provides valuable insight into how systems of inequity are perpetuated across generations and how intergroup biases related to wealth, power, and status may be mitigated and reshaped early in development.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00088-2](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00088-2)

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